BeFREE
Intel Core 2 Duo

User manual

BeFREE_UM_C2D_1_02.doc
Version: 1.02
July 2, 2010

[TIPRO]

RECORDS OF REVISION III

1 GENERAL OVERVIEW 1-3

1.1 WHAT IS WHAT? 1-3
1.2 WHAT IS NEW? 1-3
1.2.1 Features 1-3
1.3 WHERE IS WHAT? 1-3
1.4 PACKAGE CONTENTS 1-3
1.5 GETTING STARTED 1-3
1.6 CABLE MANAGEMENT 1-3
1.7 STATUS LEDS 1-3

2 WARNINGS 2-3

2.1 GENERAL PRECAUTIONS FOR TIPRO PRODUCTS 2-3
2.1.1 Damage Requiring Service 2-3
2.2 SERVICING 2-3
2.3 MOUNTING ACCESSORIES 2-3
2.4 VENTILATION 2-3
2.5 WATER AND MOISTURE 2-3
2.6 POWER SOURCES 2-3
2.7 ACCESSIBILITY 2-3
2.8 INTERNAL BATTERY 2-3
2.9 EXTENSION CORD 2-3
2.10 OVERLOADING 2-3
2.11 CLEANING 2-3
2.12 HEAT 2-3
2.13 CIRCULATION AND COOLING 2-3
2.14 REPLACEMENT PARTS 2-3
2.15 OPTIONS AND UPGRADES 2-3
2.16 OBJECT ENTRY 2-3
2.17 POWERED PORTS 2-3
2.18 CASH DRAWER 2-3

3 VERSIONS 3-3

3.1 CONNECTIVITY 3-3
3.1.1 Powered Core2Duo 3-3
3.2 CONNECTOR SPECIFICATIONS 3-3
3.2.1 24V input 3-3
3.2.2 24V output 3-3
3.2.3 12V output 3-3
3.2.4 Tipro external bus 3-3
3.2.5 Serial port 3-3
3.2.6 USB 3-3
3.2.7 Powered USB 12V 3-3
3.2.8 Powered USB 24V 3-3
3.2.9 Ethernet 3-3
3.2.10 PS/2 keyboard/mouse 3-3
3.2.11 VGA 3-3
3.2.12 Cashdrawer 3-3

4 SPECIFICATIONS 4-3

4.1 ENVIRONMENTAL 4-3
4.1.1 Non-Operating 4-3
4.1.2 Operating 4-3
4.2 DIMENSIONS 4-3
4.3 MAINBOARD 4-3

4.4 HARDDISK 4-3
4.5 RAM 4-3
4.6 TFT LCD 4-3
4.7 TOUCH PANEL 4-3
4.8 TIPRO CONTROLLER 4-3
4.9 FAN CONTROL 4-3
4.10 POWER CONSUMPTION 4-3
4.11 POWER SUPPLY 4-3
4.12 PERIPHERALS POWER RESTRICTIONS 4-3
4.13 CASH DRAWER 4-3
4.13.1 Programming Cash Drawer Ports 4-3

5 SOFTWARE INSTALLATION 5-3

5.1 DRIVER INSTALLATION UNDER WINDOWS XP 5-3
5.1.1 Step 1, Chipset drivers 5-3
5.1.2 Step 2, Graphics drivers 5-3
5.1.3 Step 3, Ethernet drivers 5-3
5.1.4 Step 4, Audio drivers 5-3
5.1.5 Step 5, Touch screen drivers 5-3
5.1.6 Step 6, Virtual COM drivers 5-3
5.2 CHANGEME INSTALLATION 5-3
5.3 DRIVER INSTALLATION FOR LINUX AND OTHER OPERATING SYSTEMS 5-3
5.3.1 Core 2 Duo based version: 5-3
5.4 CHANGEME 5-3
5.4.1 Fan control 5-3
5.4.2 Cashdrawer 5-3
5.4.3 Advanced: ON/OFF 5-3
5.4.4 Advanced: LED functionality 5-3

6 HARDWARE SETTINGS 6-3

6.1 HOW TO OPEN BEFREE 6-3
6.2 SETTING OF THE VOLTAGE ON THE POWERED COM PORTS 6-3
6.3 REPLACING HARDDISK 6-3
6.4 REPLACING RAM 6-3
6.5 CLEANING 6-3
6.6 JUMPERS 6-3
6.6.1 Clear CMOS 6-3
6.6.2 Bypass ON/OFF logic. 6-3
6.7 TIPRO CONTROLLER SERIAL COMMUNICATION 6-3

7 BIOS SETTINGS 7-3

7.1 SYSTEM TEST AND INITIALIZATION 7-3
7.2 SYSTEM CONFIGURATION VERIFICATION 7-3
7.3 AWARD BIOS SETUP 7-3
7.4 ENTERING SETUP 7-3
7.5 MAIN MENU 7-3
7.6 SETUP ITEMS: 7-3
7.6.1 Standard CMOS features 7-3
7.6.2 Advanced BIOS features 7-3
7.6.3 Advanced Chipset Features 7-3
7.6.4 Integrated Peripherals 7-3
7.6.5 Power Management Setup 7-3
7.6.6 PnP/PCI Configurations 7-3
7.6.7 PC Health Status 7-3
7.6.8 Frequency/Voltage Control 7-3
7.6.9 Load Fail-Safe Defaults 7-3
7.6.10 Load Optimized Defaults 7-3

8 REFERENCES: 8-3

RECORDS OF REVISION

REVISION	DATE	SUMMARY		AUTHOR
		PAGE		
1.0	14.04.2008		1st Issue	B.Scholten
1.01	03.08.2009		Document adapted to Core2Duo (Ver. 1.0)	M.Kamin
1.02	02.07.2010	6-8	Corrected jumper settings ser. comm	B.Scholten

- Award is a trademark of Award Software International, Inc.
- CompactFlash™ is a trademark of the Compact Flash Association.
- Intel®, Pentium® M, Celeron® M and Core™ 2Duo are trademarks of Intel® Corporation.
- Microsoft Windows® is a registered trademark of Microsoft Corp.
- ITE is a trademark of Integrated Technology Express, Inc.
- IBM, PC/AT, PS/2, and VGA are trademarks of International Business Machines Corporation.
- SoundBlaster is a trademark of Creative Labs, Inc.

1 General overview

1.1 What is what?

BeFREE is an integration of a PC and a LCD Touch Monitor, based on the existing FREE+ line. Therefore BeFREE is compatible with all existing and future FREE/FREE+ line modules. The BeFREE offers full connectivity in a very compact form and allows for easy-access serviceability. The new Core2Duo based solution is very powerful and can even perform server tasks.
BeFREE is built in the housing of the original 15" FREE+. It consist of an industrial grade motherboard, hard disk(s), DC/DC converter, touch screen, high brightness TFT and Tipro controller.
The BeFREE Core2Duo is based on Intel's 945GME chipset. Tipro currently offers the 945GME based BeFREEs with 1.83 GHz Core2Duo processor.
The Core2Duo based BeFREE exist as powered version. The powered types have powered (Retail) USB connections, powered COM ports and a cashdrawer port. It has a larger power supply so peripherals can be powered from the BeFREE.

1.2 What is new?

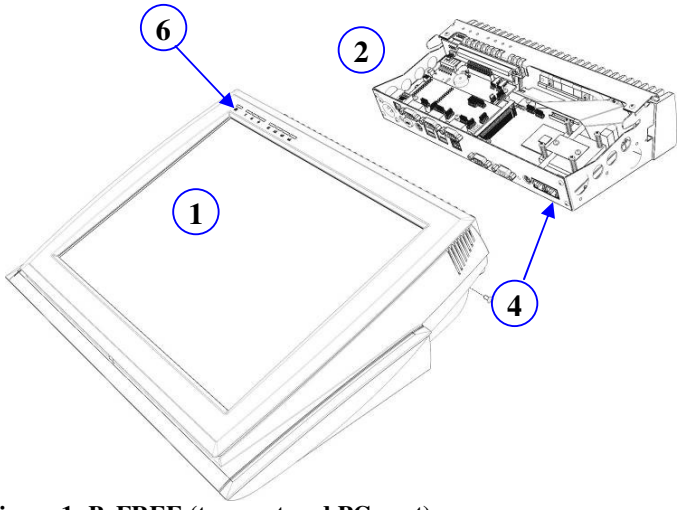
Version 2 of BeFREE has some significant changes to the first version, though general characteristics as shape, modularity and serviceability remained the same.
The biggest change is the move from VIA chipset and processor to an Intel based platform.

Besides the basic 1.0 GHz Celeron M processor, also a 1.5 GHz Celeron M processor is offered, with the same chipset (please refer to BeFREE CELERON User's Manual). And for high-end, 1.83GHz Core 2 Duo on a 945GME chipset is offered.
All internal electronics have been redesigned as well as all metal parts of the "drawer".

1.2.1 Features

- Powerful Core2Duo processor
- RAID (0,1) array possible (2^{nd} Harddisk must be ordered)
- Modular concept, can be combined with all FREE/FREE+ modules
- Can provide power to peripherals (printer, customer display, scanners, etc.)

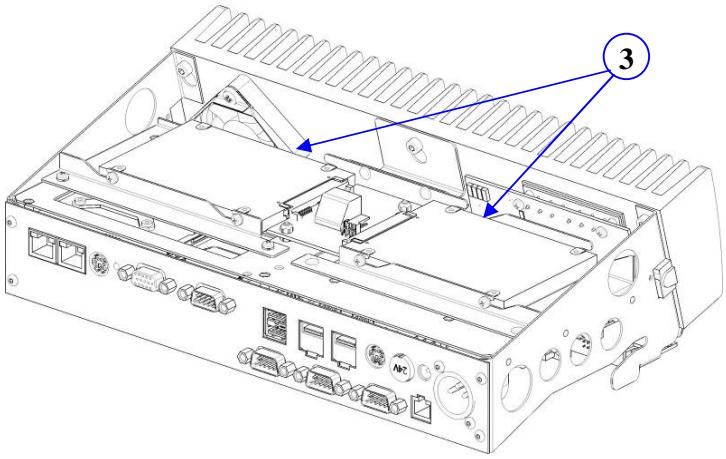
1.3 Where is what?



1 - Housing
- – High brightness TFT
- – Touch screen

2 - PC part of BeFREE
- – Tipro controller
- – Hard disk
- – Processor
- – DC-DC converter
- – Motherboard
- – Connector plate

Figure 1- BeFREE (top part and PC part)



3 - Hard disks
4 - Connector plate
5 - ON/OFF button
6 - Status LEDs

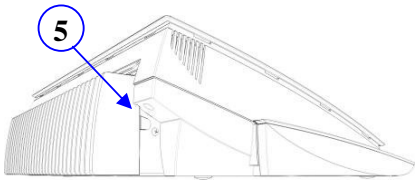


Figure 3 - left rear view

Figure 2- PC part of BeFREE (upside down)

1.4 Package Contents

1. BeFREE
2. Power supply
3. Power cord (EU)
4. CD with drivers and documentation

1.5 Getting Started

1. Place the BeFREE on a flat and even surface

2. If desired, connect devices like keyboard, network, etc.

3. Connect the external power supply to the BeFREE.
   To remove the connector, the button must be pressed while pulling the connector.

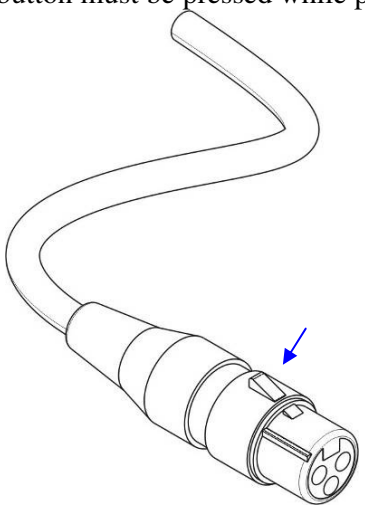


Figure 4 - Power cord

4. Connect the power supply mains cable to the outlet.

5. Press the ON/OFF button (see 1.3, point 5 -). It might take a few seconds before the image appears.

6. The system can be turned off either by the Operating System, or by pressing the ON/OFF button (you might need to hold it for a few seconds).

1.6 Cable Management

Cables can be fixed in place with the cable management.
Open the mechanism as indicated below and guide the cables through.

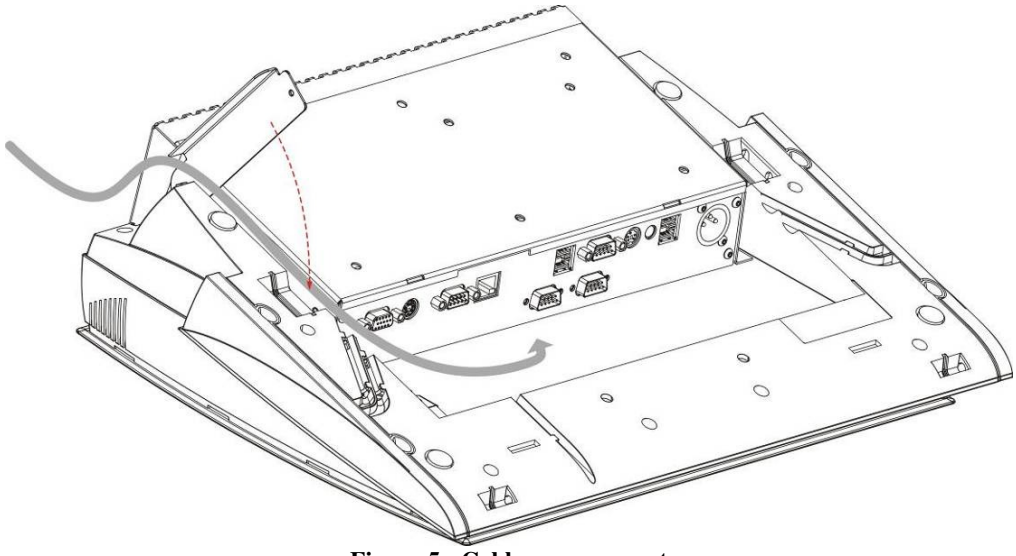


Figure 5 - Cable management

1.7 Status LEDs

	AC/DC on	BeFREE is connected to external power supply and is powered	
1	PC on	BeFREE is started	
A	Caps Lock	Caps Lock is on	
	HDD	Harddisk is working	
L1	Fan off	Inside temperature is lower than threshold, fan is off	See also 4.9
L2	Fan on	Fan is working, speed is regulated	
L3	Fan max	Fan is working at 100%, chance of overheating	
L4	Fan error	Error in fan speed regulation	

2 Warnings

Tipro products are designed to operate safely when installed and used according to the product instructions and general safety practices. The guidelines included in this chapter explain the potential risks associated with BeFREE operation and provide important safety practices designed to minimize these risks. By carefully following the information contained in this chapter, you can protect yourself from hazards and create a safer BeFREE work environment.

2.1 General Precautions for Tipro Products

Retain the safety and operating instructions provided with the product for future reference. Follow all operating and usage instructions. Observe all warnings on the product and in the operating instructions. To reduce the risk of fire, bodily injury, and damage to the equipment, observes the following precautions.

2.1.1 Damage Requiring Service

Unplug the product from the electrical outlet and take the product to a Tipro authorized service provider under the following conditions:

- The power cord, extension cord, or plug is damaged.
- Liquid has been spilled or an object has fallen into the product.
- The product has been exposed to water.
- The product has been dropped or damaged in any way.
- There are noticeable signs of overheating.
- The product does not operate normally when you follow the operating instructions.

2.2 Servicing

Except as explained elsewhere in the Tipro documentation, do not service any Tipro product yourself. Always remove the power cord before opening the BeFREE. Never run the PC-part of BeFREE separately from the screen and housing. Opening, removing covers or running PC-part separately may expose you to electric shock. Service needed on components inside these compartments should be done by a Tipro authorized service provider.

2.3 Mounting Accessories

Do not use the product on an unstable table, cart, stand, tripod, or bracket. The product may fall, causing serious bodily injury and serious damage to the product. Use only with a table, cart, stand, or bracket recommended by Tipro, or sold with the product.

2.4 Ventilation

Slots and openings in the product are provided for ventilation and should never be blocked or covered, since these ensure reliable operation of the product and protect it from overheating. The openings should never be blocked by placing the product on a bed, sofa, carpet, or other similar, flexible surface. The product should not be placed in a built-in apparatus such as a bookcase or rack unless the apparatus has been specifically designed to accommodate the product, proper ventilation is provided for the product, and the product instructions have been followed.
Make sure also the external power supply has enough free space around for heat dissipation.

2.5 Water and Moisture

Do not use the product in a wet location. BeFREE is not waterproof.

2.6 Power Sources

The product should be operated only from the type of power source indicated on the product's electrical ratings label. If you have questions about the type of power source to use, contact your Tipro authorized service provider or local power company.

2.7 Accessibility

Be sure that the power outlet you plug the power cord into is easily accessible and located as close to the equipment operator as possible. When you need to disconnect power to the equipment, be sure to unplug the power cord from the electrical outlet.

2.8 Internal Battery

Your computer may contain an internal battery-powered real-time clock circuit. Do not attempt to recharge the battery, disassemble it, immerse it in water, or dispose of it in fire. Replacement should be done by a Tipro authorized service provider.

2.9 Extension Cord

If an extension cord or power strip is used, make sure that the cord or strip is rated for the product and that the total ampere ratings of all products plugged into the extension cord or power strip do not exceed 80% of the extension cord or strip ampere rating limit.

2.10 Overloading

Do not overload an electrical outlet, power strip, or convenience receptacle. The overall system load must not exceed 80% of the branch circuit rating. If power strips are used, the load should not exceed 80% of the power strip input rating.

2.11 Cleaning

Unplug the product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

2.12 Heat

The product should be placed away from radiators, heat registers, stoves, or other pieces of equipment (including amplifiers) that produce heat.

2.13 Circulation and Cooling

Allow sufficient air circulation around the BeFREE and the external power supply during use. Prevent direct exposure to radiant heat sources.

2.14 Replacement Parts

When replacement parts are required, be sure the service provider uses replacement parts specified by Tipro.

2.15 Options and Upgrades

Use only the options and upgrades recommended by Tipro.

2.16 Object Entry

Never push a foreign object through an opening in the product.

2.17 Powered ports

Maximum current per port is 3A.
See also 4.12

2.18 Cash Drawer

The cash drawer uses the modular connectors specifically designed for cash drawers. Do not connect ordinary telephone line to these connectors.

3 Versions

Currently there is 1 type of Core2Duo BeFREE, powered type.

The version with Core 2 Duo has 1GB RAM by default (limitation is 2GB).

The following items are the same in all versions (Core 2 Duo or Celeron based – standard, powered and fanless):

- TFT
- Touchscreen
- Housing for TFT
- Tipro Connectivity
- Fan control (not in Fanless)

The powered version is supplied with 24V and offers more powered connectivity and can supply more current to peripherals than the standard version.

See also User Manual of Celeron based BeFREE for comparison.

3.1 Connectivity

3.1.1 Powered Core2Duo

No	Connector	details
1	24V input	3.2.1
2	Cash drawer	3.2.12
3	COM 4, powered	3.2.5
4	COM 3, powered	3.2.5
5	COM 2, powered	3.2.5
6	12V output	3.2.3
7	24V output	3.2.2
8	Tipro external bus	3.2.4

No	Connector	details
9	Powered USB 24V	3.2.8
10	Powered USB 12V	3.2.7
11	2x USB 2.0	3.2.6
12	COM 1	3.2.5
13	VGA, external display	3.2.11
14	PS/2 keyboard & mouse	3.2.10
15	Ethernet 10/100/1000	3.2.9
16	Ethernet 10/100/1000	3.2.9

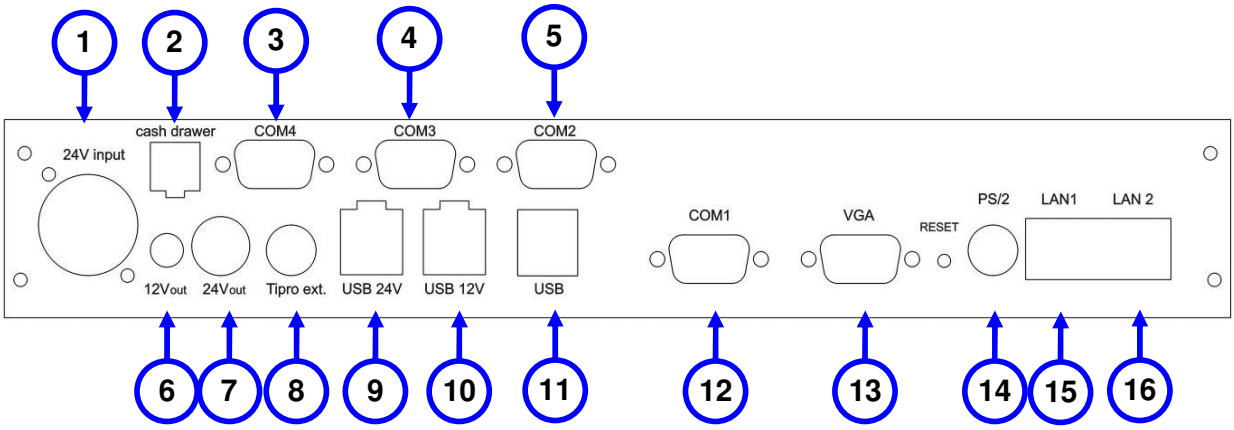
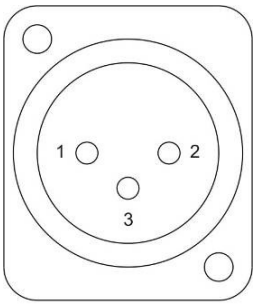


Figure 6 – Connector plate Powered Core 2 Duo

3.2 Connector specifications

3.2.1 24V input

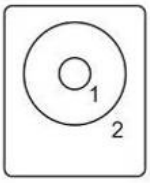


Pin #	*Name*
1	+24V
2	GND
3	N.C.

3.2.2 24V output

Pin #	*Name*
1	+24V
2	GND
3	N.C.

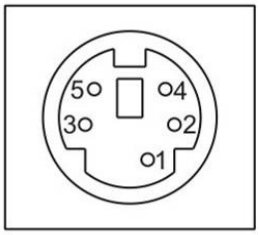
3.2.3 12V output



2.1 mm. connector.

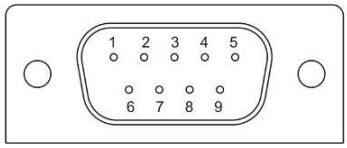
Pin #	*Name*
1	+12V
2	GND

3.2.4 Tipro external bus



Pin #	*Name*
1	TBM_CLK
2	+VTBS
3	GND
4	TBM_DATA
5	EXT_CFG2

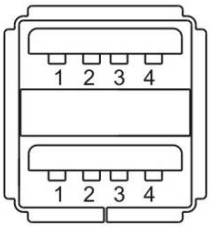
3.2.5 Serial port



Notes:
- Up to +24V on pin 9 available on Powered BeFREE.
- For current limitations see 4.12.
- To change RS232 to RS422 or RS485 on COM 2 see 7.6.4.3

COM 1		**COM 2**			**COM 3***	**COM 4***
Pin #	***RS232***	***RS232***	***RS422***	***RS485***	***RS232***	***RS232***
1	DCD	DCD	TxD-	DATA-	DCD	N/C
2	RxD	RxD	RxD+	N/C	RxD	RxD
3	TxD	TxD	N/C	N/C	TxD	TxD
4	DTR	DTR	N/C	N/C	DTR	N/C
5	GND	GND	GND	GND	GND	GND
6	DSR	DSR	TxD+	DATA+	DSR	N/C
7	RTS	RTS	N/C	N/C	RTS	N/C
8	CTS	CTS	RxD-	N/C	CTS	N/C
9	RI	RI /+5V /+12V /+24V	GND	GND	RI /+5V /+12V /+24V	RI /+5V /+12V /+24V

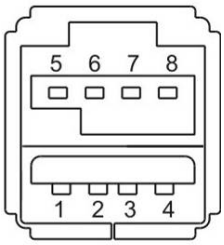
3.2.6 USB



All USB ports can provide 500mA on VBUS.

Pin #	***Name***
1	VBUS
2	D-
3	D+
4	GND

3.2.7 Powered USB 12V



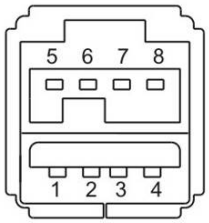
Pin out of USB part same as standard USB port, see 3.2.6.

Pin #	***Name***
1	VBUS
2	D-
3	D+
4	GND

Pin #	***Name***
5	GND
6	+12V
7	+12V
8	GND

* COM 3 and COM 4 are so-called virtual COM ports; serial to USB devices. Drivers needed, see 5.1.6

3.2.8 Powered USB 24V

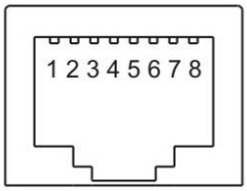


Pin out of USB part same as standard USB port, see 3.2.6.

Pin #	*Name*
1	VBUS
2	D-
3	D+
4	GND

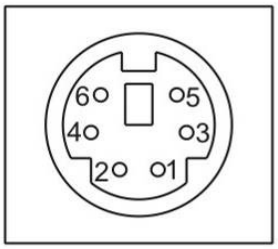
Pin #	*Name*
5	GND
6	+24V
7	+24V
8	GND

3.2.9 Ethernet



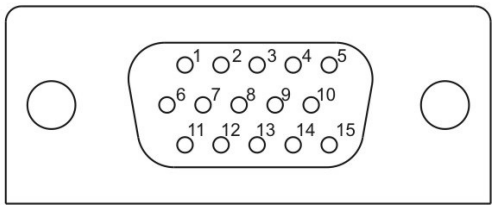
Pin #	*Name*
1	TX+
2	TX-
3	TCT
4	N/C
5	N/C
6	RCT
7	RX+
8	RX-

3.2.10 PS/2 keyboard/mouse



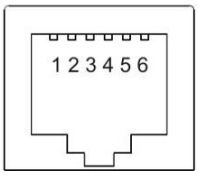
Pin #	*Name*
1	Keyboard Data
2	Mouse Data
3	GND
4	Shield
5	+5V
6	Keyboard Clock
7	Shield
8	Mouse Clock

3.2.11 VGA



Pin #	*Name*	*Pin #*	*Name*
1	CRT_RED	9	+5V
2	CRT_GREEN	10	VGA GND
3	CRT_BLUE	11	N/C
4	N/C	12	CRT_SDA
5	VGA GND	13	CRT_HSYNC
6	VGA GND	14	CRT_VSYNC
7	VGA GND	15	CRT_SCL
8	VGA GND		

3.2.12 Cashdrawer



Pin #	*Name*
1	Shield
2	Kick out 1
3	Open/Close
4	Power 24V
5	Kick out 2
6	GND

4 Specifications

4.1 Environmental

4.1.1 Non-Operating

Temperature: -20 to 40°C, till 60°C if the relative humidity is < 27% RH
Humidity: ≤ 90% RH

4.1.2 Operating

Temperature: +5°C to +35°C
Humidity: 20% to 80% RH (non-condensing)

4.2 Dimensions

BeFREE	Size [W x D x H]	weight	Power supply
Powered	409 x 345 x 112 mm.	6.60 kg.	42 x 84 x 170 mm.
		6.50 kg	30 x 58x 133 mm.

4.3 Mainboard

- Processor :
  - Intel© Core2Duo, 1.83 GHz, 2MB cache (T5600)[1]
- Chipset Intel© 82945GM GMCH + 82801GHM (ICH7-MDH)
  - Hardware RAID (0,1) support
- I/O Chipset: Winbond W83627HG-AW
- System Memory: 200-pin DDR2 SODIMM x 1 (400/533/667 MHz)
  - 1 GB
  - 2 GB (Max)
- Display:
  - Dual independent display support
  - Chipset Intel® 82945GM GMCH Integrated GMA 950 graphic
  - Memory: Intel® DVMT 3.0 supports up to 224 MB video memory
  - Resolution: Up to: 2048 x 1536 @ 32 bpp (75 Hz) in CRT mode
- Ethernet: 2 x Realtek RTL 8111C. 10/100/1000Base-TX
- Chipset Intel® 82801 GHM ICH7-M
- Audio (Optional):
  - AC97 Codec Realtek ALC883 supports 5.1 CH Audio & 7.1 CH with S/PDIF
  - Interface: Mic in, Line in, Line out
- Watchdog Timer: Generates a Time-out System Reset:
  - 1 sec. ~255 min. And 1 sec. Or 1 min./step

[1] Standard processor

4.4 Harddisk

- Interface: SATA
- 2,5" form factor
- Capacity: 160 GB,
- 16MB buffer
- Rotational Speed:
    - 7.200 rpm

4.5 RAM

	Type:	Size:
	200-pin SODIMM, DDR2, 800MHz	1GB (2GB)

4.6 TFT LCD

The TFT display is an active matrix LCD with better resolution, sharper screen display and broader viewing angle compared to passive matrix screens. 15.0" displays are used in BeFREE.

- Samsung 15.0" LTM150XH-L06
- XGA 1024×768 display format
- Brightness: 430 $_{typ}$ cd/m^2
- Contrast ratio: 400 $_{typ}$
- Viewing angle (upper/lower/left/right): 60/65/70/70º

4.7 Touch panel

A resistive touch panel is made of glass plate, covered with a polyester sheet and coated with additional layers that make an electrical contact on the pressed spot. It uses the five-wire AccuTouch technology, which has a high touchpoint density and fast response. The surface of touch screen is resistant to acetone, methylene, isopropyl-alcohol, ammonia and others.

- Accuracy : ±2mm
- Response time: <10ms
- Resolution: 4096×4096 touchpoints
- Lifetime: 35 million touches in one spot

4.8 Tipro Controller

Tipro controller is built in BeFREE. It controls Fan, Cashdrawer and all other (optional) Tipro modules connected to BeFREE.
For monitoring, setting and programming modules, fan etc. ChangeMe is used, see 5.2. For general programming please refer to Change Me Help file.

In all BeFREE versions the Tipro Controller is communicating via the USB interface. USB is used for both programming the controller and for sending key-events.
On powered BeFREEs it is possible to additionally connect the Tipro Controller to a COM port.
In some cases this might be necessary, for instance when software expects data on serial interface (i.e. data from MSR).

4.9 Fan Control

BeFREE has integrated a specially designed Fan control which ensures that BeFREE is always producing as little noise as possible.
The Fan control is a device which controls fan speed proportionally to the BeFREE's temperature. In general that means the higher the temperature is, the greater the fan speed. See chart on Figure 7– Predefined Fan control settings, which shows Fan power (rotation) dependence of temperature.
Fan control can be reprogrammed if necessary (due to environment, etc.). Reprogramming can be done by Tipro authorized service provider.
Temperature of BeFREE can be monitored in Change Me (see 5.4.1) or by using MIDAPI[1] functions.

The status of the fancontrol is shown by the LEDs on the top of the frame labeled L1 to L4.

L1	Fan control is off
L2	Fan control is working, fanspeed is relative to temperature
L3	Temperature is over maximum, fan at 100%. Serious damage might occur!
L4	Error on fan control

Note:
Optionally the LEDs can display the current layer of the Tipro controller instead of the FAN status.
Section 5.4.4 describes how to change this setting.

[1] Tipro's API. See MIDAPI documentation for more info

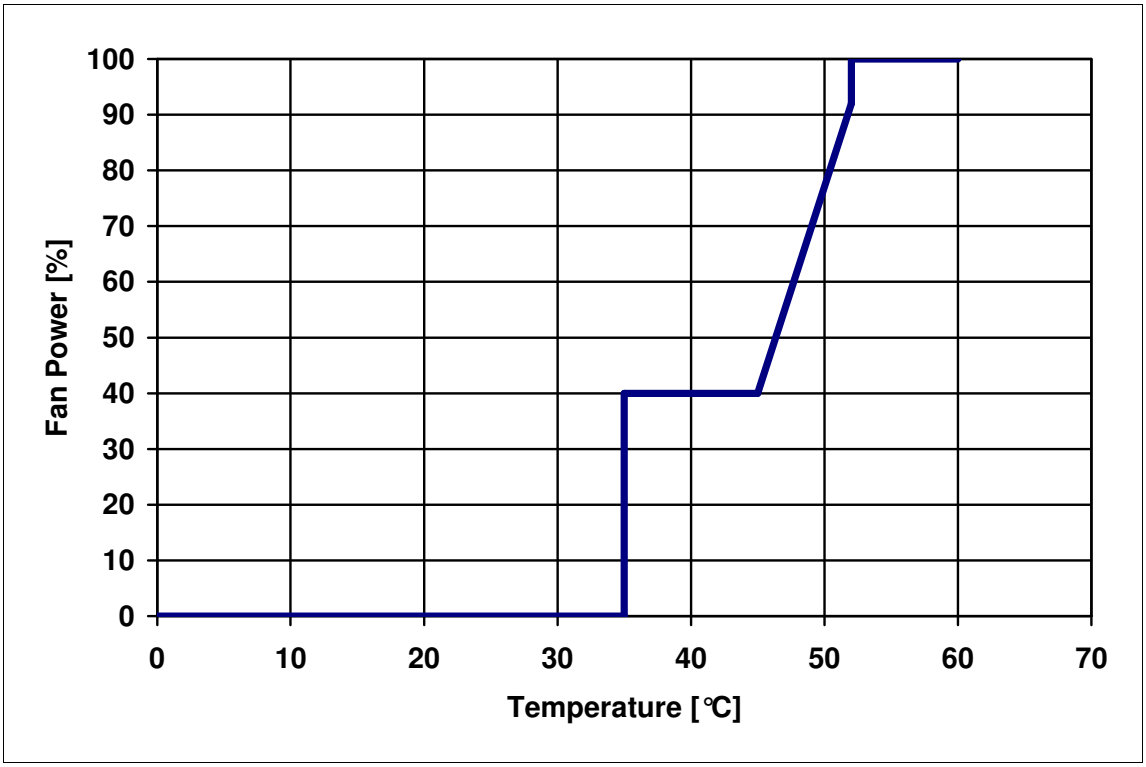


Figure 7– Predefined Fan control settings

4.10 Power consumption

BeFREE with Core2Duo 1.83 GHz Processor:

Stand by:	11W
Idle mode in Windows XP:	60W
100% disk and processor load:	80W

These are measured values with BeFREE without any additional Tipro modules and without any other peripherals.
Power consumption is higher if you connect additional external devices (e.g. printers, displays, cash drawers …)

4.11 Power Supply

- Universal Input 100~240VAC, full range
- 150W @ 24V max output power
- Meets FCC/CISPR/VCCI class B EMI
- Operating Temperature : 0°C to +40°C
- Storage Temperature : -20°C to +85°C
- 2.9m. cord, XLR connector

4.12 Peripherals power restrictions

40W total available for external devices which has to be divided over 5/12/24V

Connection type:	Maximum load per port	Symbol	Maximum power allowed:
Tipro bus	**1 A**	P_{5V}	**25.5W**
USB	**500 mA**		
COM 5V	**1 A**		
COM 12V	**1 A**	P_{12V}	**36W**
Powered USB12V	**3 A**		
12V output	**1 A**		
COM 24V	**1 A**	P_{24V}	**40W**
Powered USB 24V	**3 A**		
24V output	**2 A**		

Calculation of total used power:

$$1.1 \cdot P_{5V} + 1.1 \cdot P_{12V} + P_{24V} \leq 40W$$

Example:
Connected are:

- USB Keyboard with 30 mA consumption
- USB scanner. 155mA max.

Can we still connect an 8.4" customer display on 12V? Rating: 6W?

Calculate: $1.1 \cdot (0.03 + 0.155) \cdot 5 + 0 + 0 = 1W$

So we can easily connect the display on 12V.
Together all devices will consume 7W and the maximum rating of the 12V connection (1A) is lower than the display uses (0.5A)

4.13 Cash Drawer

BeFREE has one RJ12 connector (see Figure 6 – Connector plate Powered Core 2 Duo, No 13 and 3.2.12) for cash drawers.

The cash drawer uses the modular connectors.

! Do not connect ordinary telephone line to these connectors.

4.13.1 Programming Cash Drawer Ports

OPOS:

If your Tipro OPOS drivers don't support Cash drawer check on web site http://www.tipro.net for latest drivers or contact Tipro support mail (support@tipro.net).

All supported OPOS commands can be found in UnifiedPOS document version 1.8 on page 139 (Chapter 4).

Cash drawer names are defined in registry:
(HKEY_LOCAL_MACHINE\SOFTWARE\OLEforRetail\ServiceOPOS\CashDrawer) and are by default set to: TiproCashDrawer1 and TiproCashDrawer2.
They can be changed manually in the registry.

5 Software Installation

5.1 Driver installation under Windows XP

If you are using Windows XP then windows will find and install almost all drivers. The drivers noted below must be installed manually from the enclosed CD.
Please always check our website for possible updates (www.tipro.net/support, then choose BeFREE).

Note: Windows will find new hardware the first time you start, and it will ask you to install it. This is for the USB to serial, virtual COM ports (see 5.1.6). You can cancel this automatic installation. When you come to step 6 below, the correct drivers will be installed.

5.1.1 Step 1, Chipset drivers

Go to the directory named "Step 1 - Intel Chipset drivers" and run "**infinst_autol.exe**".
Click **Next** and accept the license agreement. Click **Next** again and than Finish.

If **RAID** mode is enabled (see 7.6.4.1.1), than you must also install "Intel Matrix Storage Manager". Go to the directory "Step 1 – Intel Chipset drivers" and run "**iata82_enu.exe**" to install the manager.

5.1.2 Step 2, Graphics drivers

Open the directory "Step 2 - Intel Graphics Driver", and then run "**Win2k_xp1425.exe**"
Click **Next** and N**ext** and accept the license agreement by clicking Yes and than click **Finish**.

5.1.3 Step 3, Ethernet drivers

Open the directory "Step 3 – Realtek Ethernet Drivers" and then run **setup.exe**.
Click **Next** and **Next** again on the next screen and **Finish**.

5.1.4 Step 4, Audio drivers

Go to the directory "Step 4 - Realtek audio Driver" and open "Windows XP" and "WDM_R145" and "5288_PG215_R145…" and run "setup.exe"
Follow instruction on the screen, and Finish installation.

5.1.5 Step 5, Touch screen drivers

Open the directory "Step 5, ELO touchscreen driver".
Run SW60650.exe.

Note: If you have a lower number (SW600390) please download updated drivers either from our website (see 5.1) or from ELO www.elotouch.com then choose support, downloads, current drivers.

Click **OK** to continue, then click **unzip**. The installation will start automatically after you press **OK** again.
Choose your language or leave default, and click **next**.
Select "Install USB Touchscreen Drivers" and click **next**. Then accept the license agreement to continue. After installing click **Finish**.
The calibration should start automatically, (otherwise go to Start > Control Panel (classic view) > ELO Touchscreen, **Align**)
To calibrate press the shown targets (3), test and accept the settings.

5.1.6 Step 6, Virtual COM drivers

Open the Directory "Step 6 – FTDI virtual COM driver" and run CDM2.02.4.exe.
Press **enter** on the keyboard to finish the installation.
Windows will find new hardware, dual RS232

5.2 ChangeMe installation

Please check our website for the latest update (see 5.1).
Go to the "ChangeMe" directory and run Setup.exe.
Click **next**, you can optionally change the installation directory, click **next** again, choose "complete", **next** again and finally **install**.
You must restart the BeFREE, do this by choosing "Yes, I want to restart my computer now" and click **Finish**.

The first time you run ChangeMe (Start → All Programs → Tipro Keyboards → ChangeMe) it will detect new hardware and install the Tipro Keyboard automatically.
Because this takes some time, the autodetect feature of ChangeMe will not find the keyboard at first. Wait until Windows reports that the "new hardware is installed and ready to use".
Now click **autodetect** to detect the integrated modules.

5.3 Driver installation for Linux and other Operating Systems

Other Operating systems are not actively supported by Tipro.
All hardware integrated does support Linux, but this might be limited to certain distributions. Below is a list of integrated chipsets, if Linux driver is available, the driver location is on the CD or in the manufacturer's website.

5.3.1 Core 2 Duo based version:

Intel	chipset	Chipset Intel 945GM	www.intel.com , support→ download→ chipsets→ embedded chipsets→ low power – Mobile Intel 945GME
Realtek	ethernet	RTL8111C (until September 2009 : RTL8111B)	www.realtek.com , Downloads→Communications Network ICs→ Network Interface controllers→10/100/1000M Gigabit Ethernet→PCI Express→Software
	audio	AC'97, ALC883	On CD or: www.realtek.com , Downloads→Computer peripheral ICs→ PC audio codecs→Software
ELO	touchscreen		http://elotouch.com/Support/Downloads/default.asp
FTDI	USB to RS232 (virtual COM)	FT2232D	http://www.ftdichip.com/Drivers/VCP.htm

5.4 ChangeMe

The first time you run ChangeMe, drivers for Tipro USB controller will install automatically. Let the installation finish, then press “autodetect” to search for the controller.
The next times you run ChangeMe it will detect automatically the controller in BeFREE on USB[1].
Press on the BeFREE icon to open the dialog.

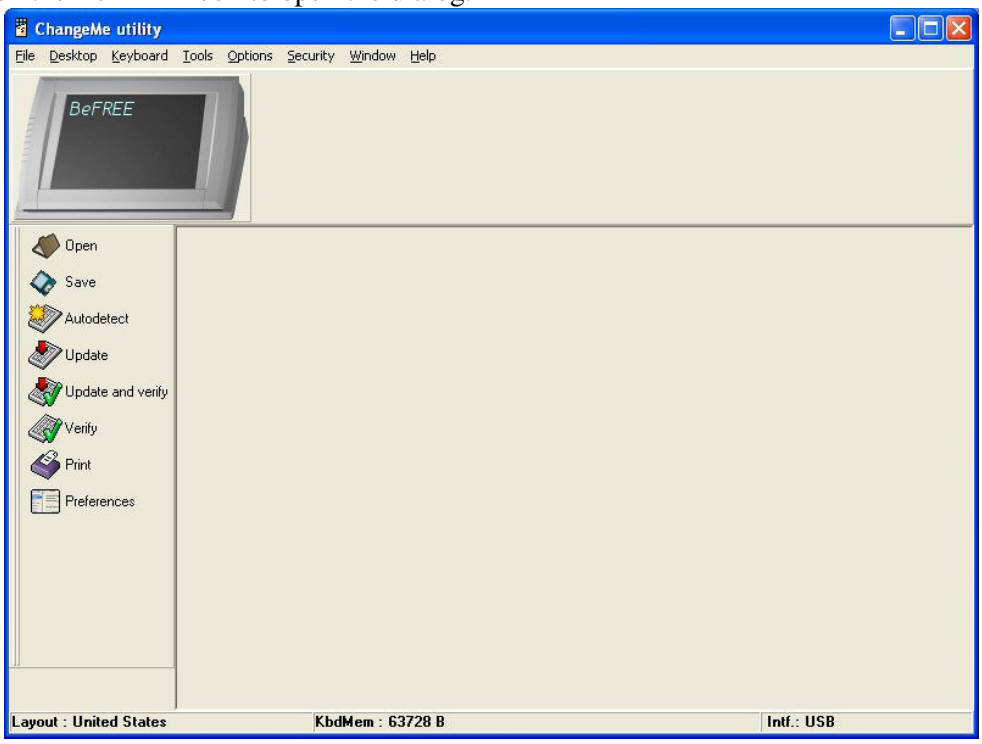


Figure 8 - ChangeMe main window

[1] USB is the default interface. Powered BeFREEs can optionally also communicate via serial interface, see 4.8 and 6.7.
To change the interface in ChangeMe double click on “Intf: USB” in the lower right corner of the main window (see Figure 8 - ChangeMe main window) and select COM 4, 9600 baud rate.

5.4.1 Fan control

The Fan control window is just for information purposes. Press on “Read” to get the air temperature inside BeFREE and the relative fanspeed.

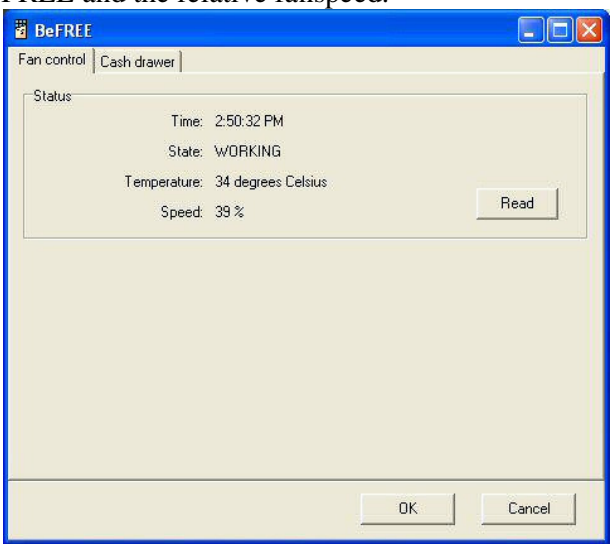


Figure 9 - Fan control dialog

5.4.2 Cashdrawer

The Cashdrawer window is used for testing the cashdrawer port.
Although the window is shown for all versions of BeFREE, it functions just for Powered BeFREEs, which have a cashdrawer port.

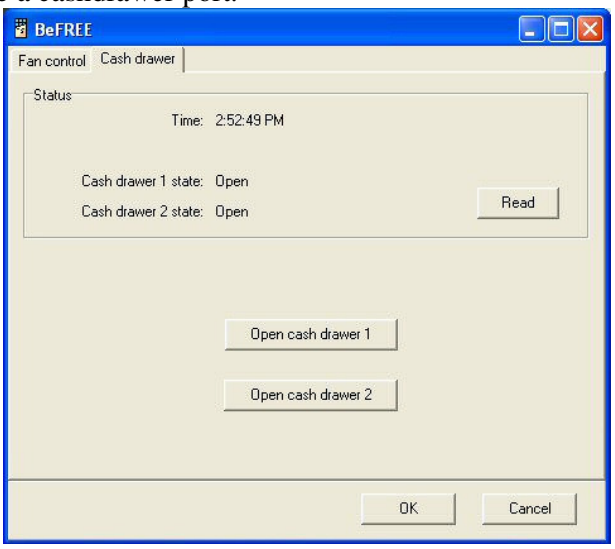


Figure 10 - Cashdrawer dialog

Press “Read” to get the current status of the drawer(s). In case no cashdrawer connection is present (standard and fanless BeFREE) the status “open” is shown.
On the Powered BeFREE the status is “closed or not connected” when no cashdrawer is present or when it is connected and closed[1]. The Status is “open” when the drawer is open.
Use the buttons below to test opening the drawer.

[1] Since the connector allows for only one open/close signal, the signal for both drawers is combined. So if either one of the drawers is open both Drawer 1 and Drawer 2 indicates open.

5.4.3 Advanced: ON/OFF

Advanced ON/OFF is a feature to protect the system against accidental and unauthorized turning on or off.
To turn the BeFREE on or off when in this mode, the user needs to press the power button 3 times in a fast sequence.

Normally this tab is hidden since there is a risk of not being able to start the BeFREE again if this is set by mistake.
To show this tab you have to go to ChangeMe's "debug mode" by pressing the keys <Ctrl> + <Backspace> at the same time when in the main window. You will see 2 extra menu items in the menu bar: Extended Tools and Debug.
When you now click on the BeFREE icon again you will see the extra "Advanced" tab.

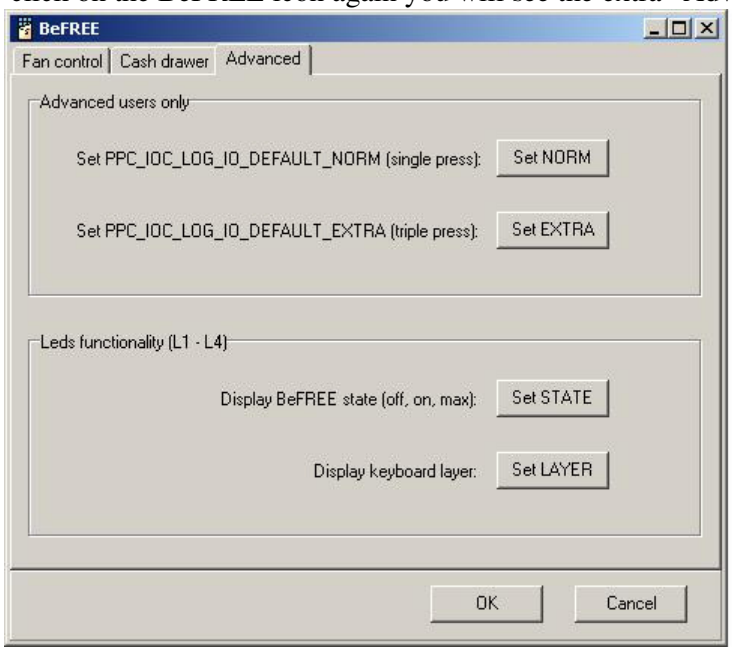


Figure 11 - Advanced dialog

Set EXTRA sets the Advanced ON/OFF feature.
Set NORM restores the ON/OFF configuration to normal, default behavior

Testing:
The best is to test this feature before turning off the system!
Set the Advanced ON/OFF by pressing the Set EXTRA button.
Set the Action for the power button to "Ask me what to do", see below.
Press the power button quickly 3 times in a row. If you have the correct timing, the dialog will appear asking you if you want to shut down the system. Select Cancel.
Repeat this a few times to get the correct timing each time you try.

Another way of protecting the BeFREE from turning off is by disabling the turn off by button in Windows:

Start → Control Panel → Power Options, Advanced Tab, Power Button;
Change setting to:

- Do nothing - no reaction when the button is pressed. Turn of the BeFREE by going to Start → Shut Down.

- Ask me what to do – dialog will appear asking you what to do.

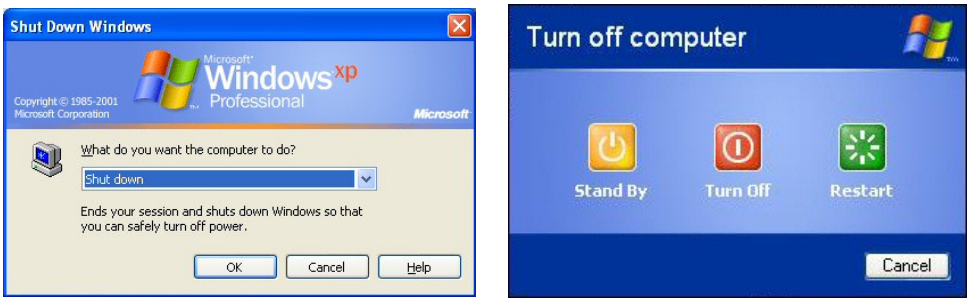


Figure 12 - Shut Down Dialogs

What if things go wrong?
If for some reason you are not able to start the system you will have to open the BeFREE and set a jumper to bypass the ON/OFF feature. See 6.6.2 for details.

5.4.4 Advanced: LED functionality

To enable the Advanced tab, see 5.4.3 above.
Check Figure 11 - Advanced dialog for reference.
Choose “Set State” to show the fan status on the LEDs L1 – L4, as described in 4.9 (default)
Optionally you can also display the current layer of the Tipro controller, as is displayed on Tipro keyboards. To do this, press the button “Set Layer”.

6 Hardware settings

6.1 HOW TO open BeFREE

!	Always remove the power cord when opening the BeFREE!

Tools:

- Philips (cross) screwdriver

Procedure:

1. Remove all connectors from BeFREE
2. Turn BeFREE upside down. Place some soft protection under the screen!
3. Remove the 2 screws on either side of the housing as indicated on the drawing:

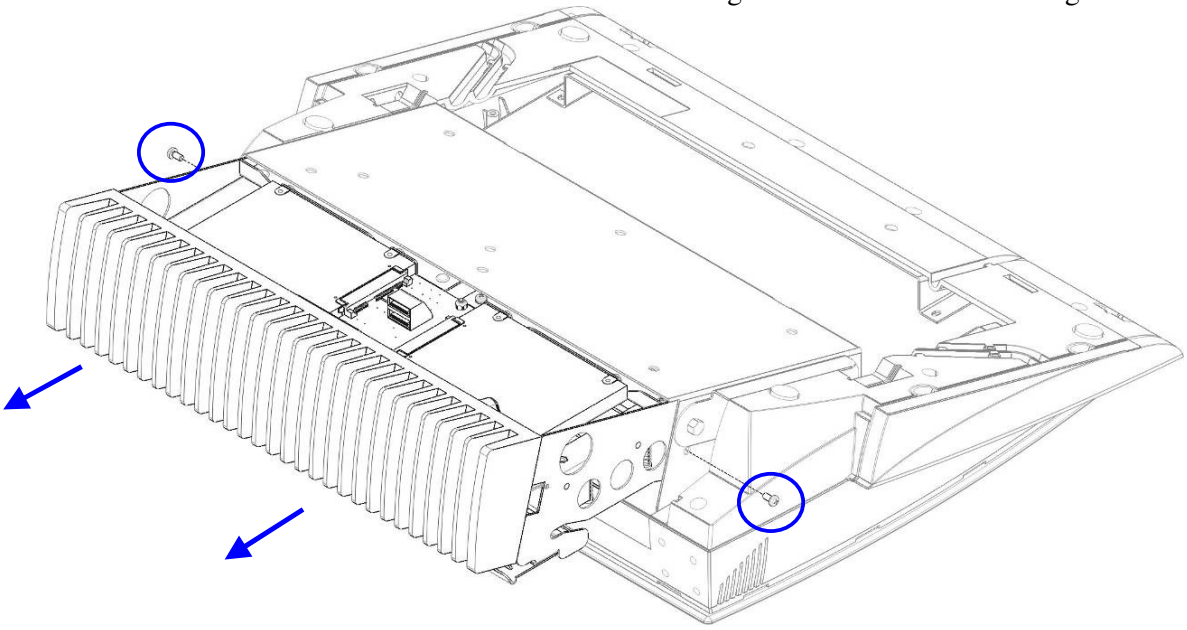


Figure 13 - Open BeFREE

Now the PC-part can slide out. You might have to push at the connector side and pull at the heatsink side.
Now you can reach the harddisk (see 6.3) and RAM (see 6.4) at the bottom side of the PC-part.
If you turn around the PC-part you can reach the jumpers to set voltage on powered COM ports (see 6.2)

To close BeFREE again:

1. Slide the PC-part back into the housing
2. Fix the 2 screws at the sides
3. Replace all original cables

6.2 Setting of the voltage on the powered COM ports

COM 2, COM 3 and COM 4 on powered versions can be configured to have power on pin 9[1].

For maximum allowed load see 4.12 for powered BeFREE

- First step is to open the BeFREE. Follow steps described in previous section.
- Next step is to turn around the PC part so that you can see the top.

The jumpers JP3, JP4 and JP5 are located on the Add-on board as indicated below.

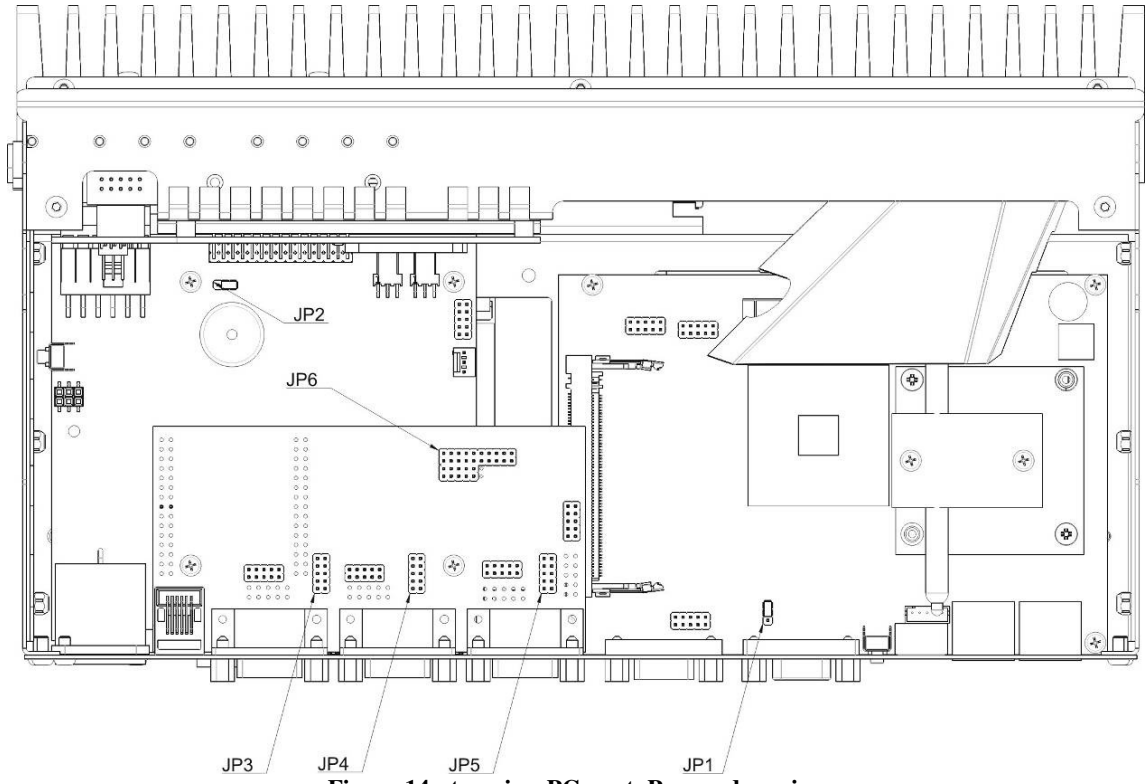
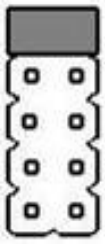


Figure 14 - top view PC-part, Powered version

[1] See 3.2.5

Jumpers JP3, JP4, JP5 can configure pin 9 on COM 2,3,4



Ring, no power, default

Not in use

5V

12V

24V

Jumper:	Port:
JP3	COM4
JP4	COM3
JP5	COM2

Note: For easier orientation see the white printed labels on the Add-on board.

6.3 Replacing Harddisk

Open the BeFREE as described in section 6.1.

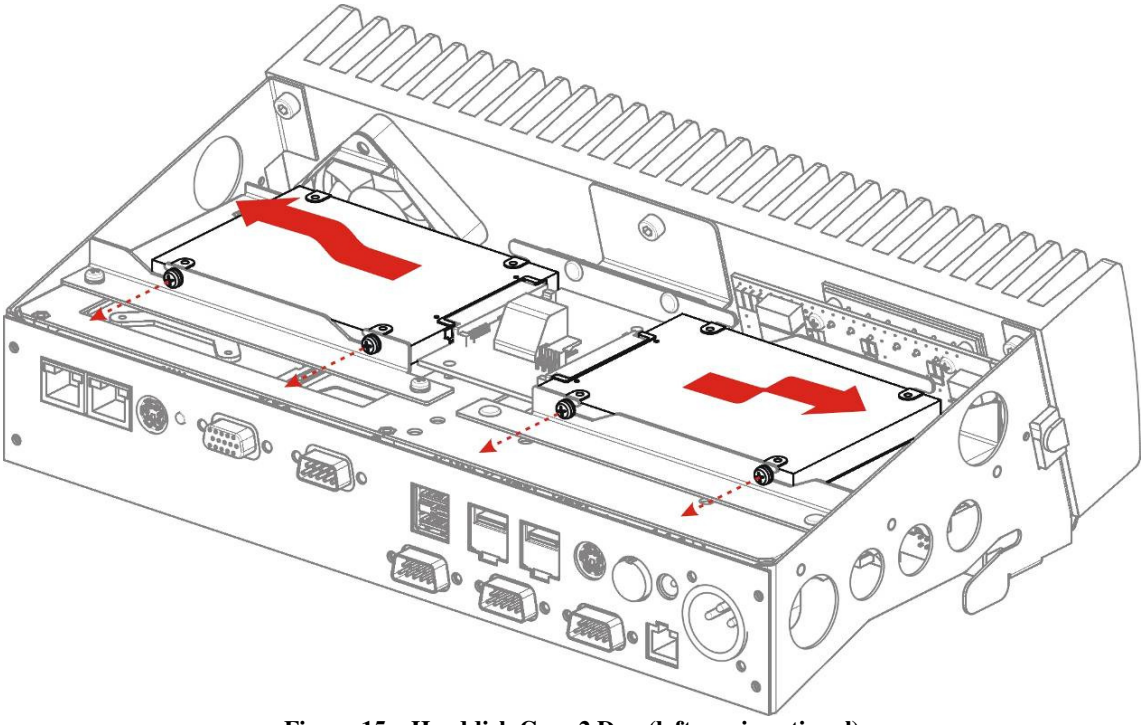


Figure 15 – Harddisk Core 2 Duo (left one is optional)

The harddisks are positioned at the bottom of the PC-part.

- Release the 2 screws per Harddisk as indicated on the drawing above. Don't remove them totally, as they guide the harddisk when sliding out.
- Slide the harddisk as indicated on the picture above, until it comes out of the metal guides.
- Remember how the harddisk is/was oriented, so you can re-connect the new disk in the same way.
- Make sure the harddisk is turned correctly and on the right side.
- Check if the 2 screws at the rear (near the heatsink) are fixed till the end and the 2 screws in front are loose enough to slide in the metal guide.
- Slide the harddisk back in position until it can't go further.
- Fix the 2 screws in front.
- Slide the PC-part back into the housing.
- Fix the 2 screws at the sides.

6.4 Replacing RAM

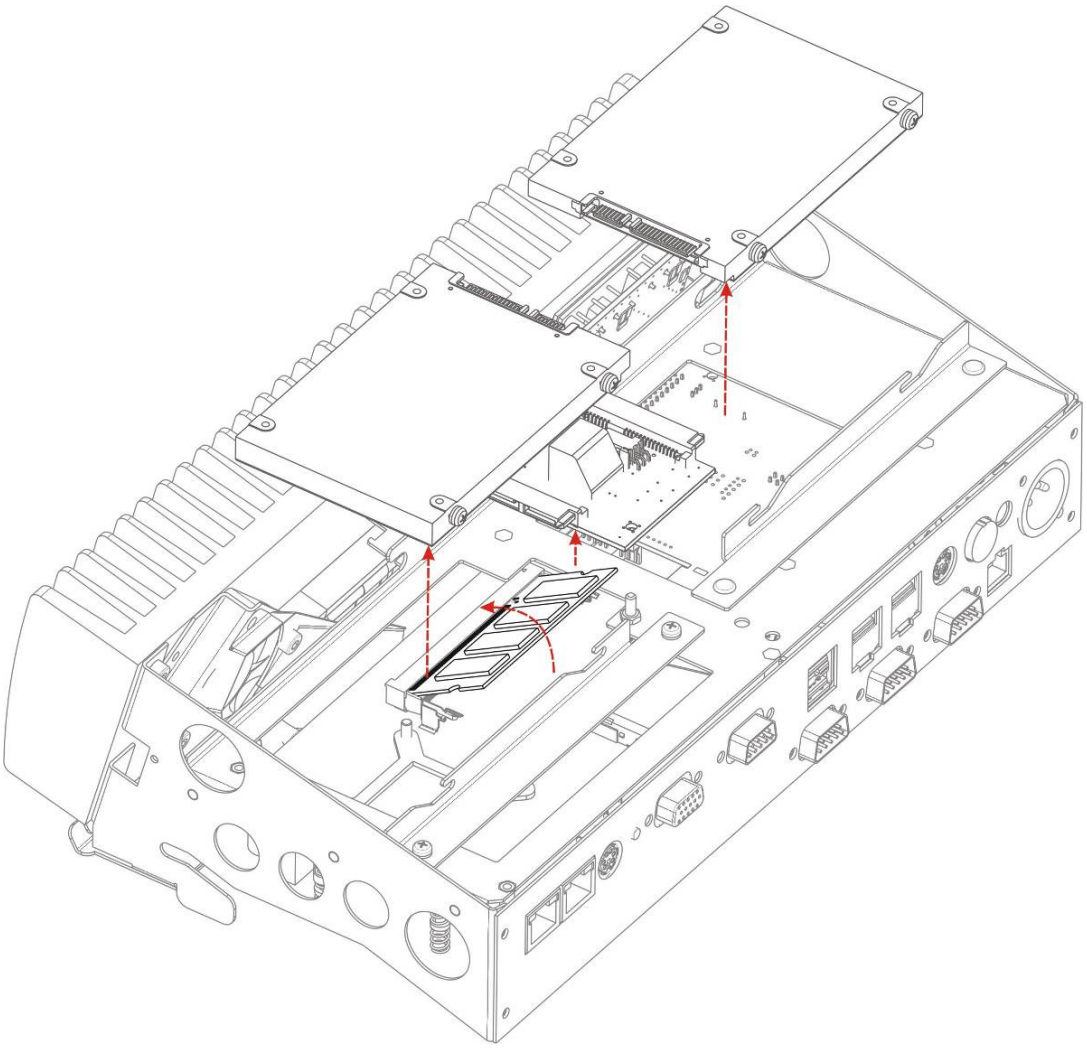


Figure 16 - Replacing RAM

Use only supported memory modules. See 4.3
Open BeFREE as described in section 6.1

- Turn BeFREE drawer (PC-part) upside down.
- Remove both Harddisks (left one is optional) see 6.3
- Remove connection PCB in the middle (use Nut Driver 5.5 HEX tool to unscrew 2 nuts)
- Lift the PCB
- Release the two springs at either side of the memory module, the module will “pop-up”
- Pull the memory module out in the direction it is already oriented.
- Place the new memory module at an angle, push it till the end. Make sure it is oriented correctly. The cut-out between the contacts must be aligned with the tooth on the connector.
- Push it down, until the springs snap into place and hold the module.
- Place the connection PCB back and fasten the nuts.
- Place the Harddisks back. See 6.3

6.5 Cleaning

You should clean BeFREE's screen display with dry soft, clean cloth. Then you should wipe the cloth across the display from left to right, moving from the top of the display down to the bottom of the display. If your display contains grease or some other contaminant, then you should dampen your cloth with water.

You should also use some non-aggressive cleaners as:

- ⇒ Water.
- ⇒ Water with a tiny amount of soft liquid soap.
- ⇒ Isopropyl Alcohol.
- ⇒ Commercial glass cleaners that do not contain ammonia.

6.6 Jumpers

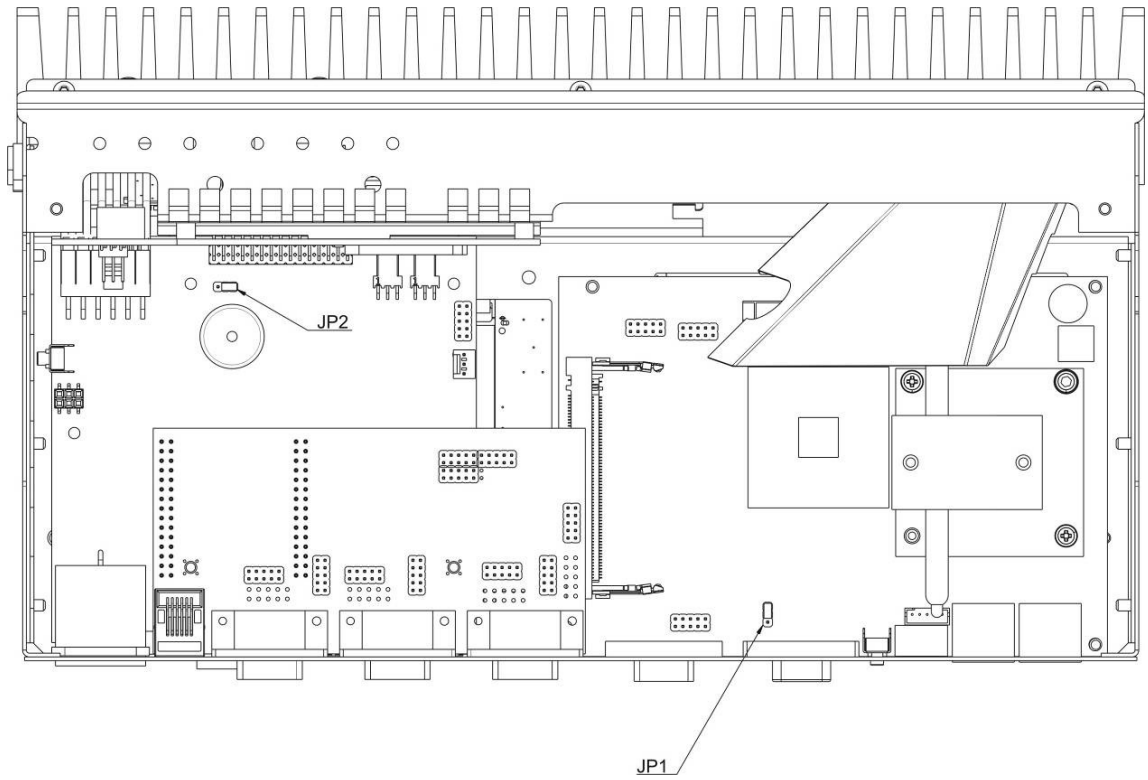


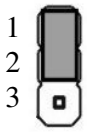
Figure 17 - Core 2 Duo Jumpers position

6.6.1 Clear CMOS

To reset the BIOS to it's original -factory- setting place the jumper JP1 (see picture above) for a short time to position 2-3, after that place it back to it's original position 1-2.

Close the BeFREE and restart the system.

JP1

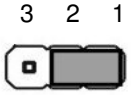


Normal position

6.6.2 Bypass ON/OFF logic.

In case the system cannot be started, something might be wrong with the built-in ON/OFF logic on the Tipro Controller.
Place the jumper JP2 (see Figure 17 - Core 2 Duo Jumpers position) to position 2-3 to bypass the logic and connect the ON/OFF button directly to the mainboard.
Advanced ON/OFF as described in 5.4.3 is disabled in this case.

JP2



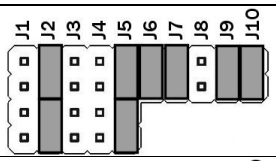
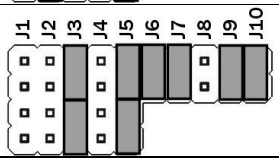
Normal position

Note:

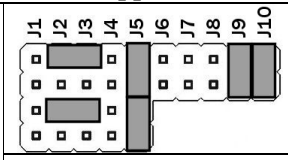
A fault can also happen when a faulty module is connected to BeFREE, or when a module is wrongly connected via Tipro bus. Verify this first before opening BeFREE

6.7 Tipro Controller serial communication

On the Core2Duo BeFREE the Tipro Controller can be set to communicate via RS232[1]. USB communication is also still possible. The connector COM 4 cannot be used in this case.
After the BeFREE is opened (see 6.1), the jumpers can be found behind COM port 2, at the edge of the board (see Figure 18, JP6).
To enable the serial controller communication both jumpers J2 must be moved to J3

• Connector COM port 4 functional • Tipro controller USB	default	
• Connector COM port 4 not functional Tipro controller on USB *and* on COM 4	optional	

In certain cases it might be desired to connect the Tipro Controller to RS232, but not to use the USB to serial converter of COM 4 (e.g. Operating System without USB support):

• Connectors COM port 4 and port 2 not functional • Tipro controller on USB *and* on COM 2	Option 2 - bypass USB to serial (virtual COM)	
		And move cable from Connertor C3 to C4. Check position of pin1!

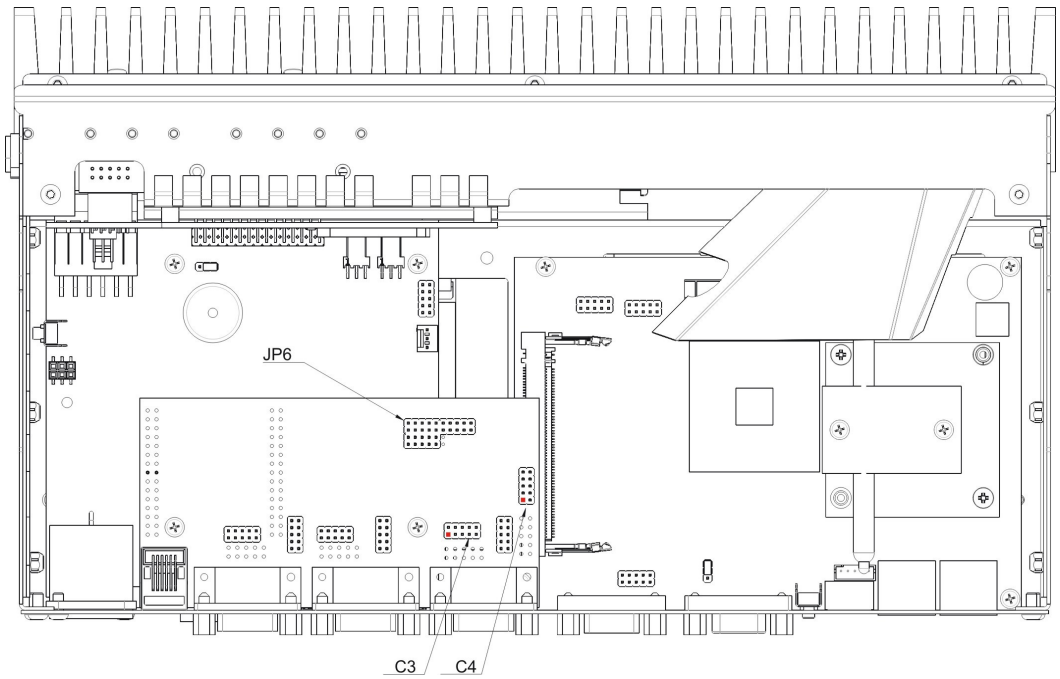


Figure 18 - serial communication Tipro Controller, JP6

[1] Refer to ChangeMe help file for information on changing interface from USB to RS232

7 BIOS settings

Any changes to the BIOS, except changing date/time and boot order, are not recommended by Tipro and are at the customers own risk[1].
You can always recall Tipro default settings by selecting “Load optimized defaults” in the main menu (see 7.6.10).

7.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions: Press <F1> to RESUME.
Write down the message and press the F1 key to continue the boot up sequence.

7.2 System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.
There are two situations in which you will need to change the CMOS settings:
1. You want to change the boot order.
2. The CMOS memory has lost power and the configuration information has been erased.

7.3 Award BIOS Setup

Awards BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

7.4 Entering Setup

Power on the computer and press <Del> key immediately when the Tipro logo is shown. This will allow you to enter Setup

7.5 Main menu

Once you enter the Phoenix - Award BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

[1] Any repairs and support that are a consequence of changes to the BIOS, other than date/time or boot order, are not covered under warranty.

Note that a brief description of each highlighted selection appears at the bottom of the screen.

7.6 Setup Items:

The main menu includes the following main setup categories.
In normal conditions you would need at most to enter (one of) the following items:

- Standard CMOS Features

Use this menu for basic system configurations, such as time, date etc.

- Advanced BIOS Features

This setup includes all the items of Award special enhanced features.

- Integrated Peripherals

This setup is to specify your settings for integrated peripherals.

- PC Health Status

This entry displays the current status of your PC.

- Load Fail-Safe Defaults

This menu to load the BIOS default values for the minimal/stable performance of your PC

- Load Optimized Defaults

This item to load the default factory settings for BIOS for optimal system performance...

- Set Supervisor / User Password Setting

Change, set, or disable password. It allows you to limit access to the system and Setup, or just to Setup.

- Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

- Exit Without Saving

Abandon all CMOS value changes and exit setup.

7.6.1 Standard CMOS features

7.6.1.1 Date and Time Configuration

The BIOS determines the day of the week from the other date information. This field is for information only.
Press the left or right arrow key to move to the desired field (day, month, year).
Press the PgUp/- or PgDn/+ key to change the setting, or type the desired value into the field.
The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00 hours.
Press the left or right arrow key to move to the desired field. Press the PgUp/- or PgDn/+ key to increment the setting, or type the desired value into the field.

7.6.1.2 IDE Primary Master

The BIOS supports up to two IDE drives. This section does not show information about other IDE devices, such as a CD-ROM drive, or other hard drive types, such as SCSI drives.

NOTE:

We recommend that you select type AUTO for all drives. The BIOS can automatically detect the specifications and optimal operating mode of almost all IDE hard drives. When you select AUTO for a hard drive, the BIOS will detect its specifications In case detailed manual setup is needed, please contact Tipro support for additional information

7.6.1.3 Halt On

During the power-on-self-test (POST), the computer stops if the BIOS detect a hardware error. You can tell BIOS to ignore certain errors during POST and continue the boot-up process.

7.6.2 Advanced BIOS features

Most important in this menu is the boot order.
Select the desired option for first-, second- and third Boot Device. If you booting from LAN, additionally the LAN boot ROM must be enabled (see 7.6.4.4)

7.6.3 Advanced Chipset Features

Leave all settings to default.
Make sure that Boot display is set to CRT+LCD and that the Panel Type (LVDS) is set to 1024x768 24 bits.

7.6.4 Integrated Peripherals

7.6.4.1 OnChip IDE Device

The chipset contains a PCI IDE interface with support for one IDE channel and two SATA channels. Select Enabled to activate the primary IDE interface. Select Disable to deactivate this interface.

7.6.4.1.1 RAID

Under On-Chip Serial ATA Settings you can define SATA mode. It can be set to IDE, RAID or AHCI.

RAID arrays (0, 1) can be modified in the Intel Matrix Storage Manager, to enter into it press CTRL+I when booting.

When RAID is enabled, additional drivers must be installed (iata82_enu.exe – from installation CD).

Note: By default BeFREE Core2Duo is delivered with one SATA Harddisk. For RAID functionality second Harddisk must be ordered.

7.6.4.2 Onboard Device

USB Controller [Default: Enabled]	Enable / Disable USB Controller.
USB 2.0 Controller [Default: Enabled]	Enable / Disable USB 2.0 Controller. High speed mode will turn on when high speed device were attached.
USB Keyboard Support	Enable / Disable USB Keyboard
USB Mouse Support	Enable / Disable USB Mouse
AC97 Audio Select [Default: Auto]	This item allows you to select the Audio codec. [Auto/Azalia/AC97 Audio only/All Disabled]

7.6.4.3 SuperIO Device

OnBoard Serial Port 1 / Serial Port 2 1: [Default: 3F8/IRQ4] 2: [Default: 2F8/IRQ3]	Auto: BIOS will automatically setup the port address. 3F8/IRQ4: Enable onboard Serial port and address is 3F8, IRQ set to 4. 2F8/IRQ3: Enable onboard Serial port and address is 2F8, IRQ set to 3. 3E8/IRQ4: Enable onboard Serial port and address is 3E8, IRQ set to 4. 2E8/IRQ3: Enable onboard Serial port and address is 2E8, IRQ set to 3. Disabled: Disable onboard Serial port.
COM PORT 232/422/485 Type [Default: RS232]	It allows you to select the COM 2 Port mode.
UART Mode Select [Default: Normal]	Leave to default value
⋮	Leave to default value
PWRON After PWR-Fail [Default: Off]	(Off, On, Former-Sts). If enabled the system will automatically reboot up if it shut down because of power failure.

7.6.4.4 OnBoard LAN Boot ROM

By default LAN boot ROM is disabled, if you booting from LAM you must enable it.

7.6.5 Power Management Setup

Leave all to default.

7.6.6 PnP/PCI Configurations

Leave to default settings.

7.6.7 PC Health Status

You can set the shutdown temperature of the system. Default this is set to 70^{o}C.
All other values are for information purposes only.

7.6.8 Frequency/Voltage Control

Leave to default values

7.6.9 Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.
In our case it is also safe to load Optimized Defaults.

7.6.10 Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. In our case this is the same as Load Fail-Safe

8 References:

- ECM-945GM 4th edition User's Manual
- Change Me Help
- MIDAPI Help
- FREE Technical specification
- Technical Overview BeFREE